MIRANT DELTA, LLC - DRAFT

Mirant Proposed BDCP Covered Activities

Goal:
To generate electric power at the Delta Plants to meet the demands of the California and Western electric grid.

Brief Covered Activity Description:

Mirant's Covered Activities are those activities associated with the generation of power at its Pittsburg and Contra Costa Power Plants (together the Delta Plants). These activities can be divided into three categories: (1) current power generation activities and water intake and discharge flows associated with those activities; (2) recurrent maintenance activities required to ensure continued operation of those existing facilities; and (3) potential future unit replacement projects at both plants, which would be anticipated to have much lower associated intake and discharge flows than the existing power generation facilities. The Pittsburg Power Plant is located on the southern shore of Suisun Bay near Pittsburg, California (Figure X-1), and the Contra Costa Power Plant is located 12 miles upstream on the southern bank of San Joaquin River near Antioch, California (Figure X-2) [Figures to be inserted].

Initially the Mirant activities to be covered by the BDCP are continued operation of the Delta Plants, which are dependent on the withdrawal of cooling water for non-consumptive once-through cooling purposes. Thus the primary goal for Mirant's initial Covered Activities will be to maintain existing levels of operation and associated water flows, but Mirant expects that its Covered Activities will evolve over the next few years as the BDCP process continues. Additionally, Mirant's operations are constrained by its Clean Water Act National Pollution Discharge Elimination System (NPDES) permits and specifically by Clean Water Act section 316(b) of the federal Clean Water Act. Mirant's operations are also constrained by regulatory requirements imposed by federal and state energy agencies. These independent regulatory constraints may alter Mirant's Covered Activities for the purposes of the BDCP in both the short-term and long-term.

Longer-term Covered Activities may include the replacement of existing power generation units, and Mirant anticipates that any new units would not utilize once-through cooling technology. Accordingly, the impacts to covered species associated with longer-term water intake and discharge activities are expected to be much less than those associated with the initial Covered Activities.

Expanded Covered Activity Description:

- **Existing Plants Operation**

Mirant's Delta Plants have a total generating capacity of 2,090 gross megawatts (1,985 net megawatts). Mirant's generating units burn natural gas and are designed to be cooled by water from the San Joaquin-Sacramento River Delta. Cooling water is drawn into the plants through 9.5 mm (3/8 inch) screens, pumped to condensers, used to cool spent steam and then discharged immediately back into the San Joaquin-Sacramento Delta. Source waters for the Delta Plants' cooling water systems are characteristic of this part of the Bay-Delta that separates the upstream, freshwater Delta from the downstream, saltwater bays.

- *Pittsburg Power Plant*

The Pittsburg Power Plant (PPP) consists of seven natural gas-fired generating units, four of which have been retired. PPP Units 5&6 were built in 1960 and 1961, respectively, and generate a total of 660 gMW of power. PPP Unit 7 was built in 1972 and generates 740 gMW. Cooling water for the PPP is withdrawn from Suisun Bay through two adjacent shoreline intake structures. Units 5&6, both once-through cooled units, are each serviced by two variable frequency circulating water pumps (CWP) that withdraw water from the Units 5&6 intake structure. Each pump has a maximum design flow of 115.6 million gallons per day (MGD)(354.7 acre-feet(AF)/day) or 231.1 MGD (709.1 AF/day) per unit (Table X-1). The approach water velocity in front of the bar racks can range from 0.5 to around 0.2 feet per second depending on how much electric generation is needed and the number of the variable frequency pumps in operation. Unit 7, which is equipped with two mechanical-draft cooling towers and a large cooling water canal, withdraws make-up water through the Units 1-7 intake structure. Unit 7's closed-cycle system uses up to 44 MGD (135 AF/day) of make-up water.

In addition to the Units 5-7 cooling water intake requirements, the PPP withdraws water from the Units 1-4 intake structure for station water supplies, for intermittent intake screen washing, and for fire suppression purposes. At maximum operation, these additional uses account for approximately 43.6 MGD (133.8 AF/day). The total current design flow for all PPP operations is approximately 565.2 MGD (1,734 AF/day)(Table X-1).

Table X-1. Total PPP design maximum flows by subsystem

	Flow (GPM)	Flow (MGD)	Flow (AF/Day)
Circulating Water Pumps			
Unit 5	160,500	231.1	709.1
Unit 6	160,500	231.1	709.1
Subtotal	**321,000**	**462.2**	**1,018.2**
Continuous Pumps			
Unit 7 Make-up Water Pump	30,300	43.6	133.8
Station Service Pumps(1)	27,000	38.9	119.4
Jockey Pump (Fire Suppression)	20	0.03	0.1
Subtotal	**57,320**	**82.5**	**253.3**
Intermittent Pumps			
Units 1-4 Screenwash Pumps (2)	6,750	9.7	29.8
Units 5&6 Screenwash Pumps (3)	5,400	7.8	23.9
Fire Suppression-Main Pump (4)	2,000	2.9	8.9
Fire Suppression-Auxiliary Pump (4)	0	0	0
Subtotal	**14,150**	**20.4**	**62.6**
TOTAL	**392,470 GPM**	**565.2 (MGD)**	**1,734 (AF/Day)**

1. Since the retirement of Units 1-4 in 2004, one of the six station service pumps operates 24 hours per day (6.5 MGD).
2. Since the retirement of Units 1-4 in 2004, two of the three screenwash pumps are still operated about 1 hour/week for maintenance (0.04 MGD).
3. Design flows for pumps are reported. Two of the three pumps typically operate for a total of 90 minutes per day (3.9 MGD).
4. The fire suppression pumps are always available for emergency situations. The normal operating flows are based on testing each pump up to one hour per week to assure pump reliability and occasionally to flush the header system. Flows are calculated assuming the main pump is used for 25% of the year.

- *Contra Costa Power Plant*

The Contra Costa Power Plant (CCPP) consists of seven natural gas-fired generating units, five of which have been retired. Units 6&7 were built in 1964 and generate a total of 690 gross megawatts (gMW) of power. Units 6&7 are equipped with once through cooling which utilizes water withdrawn from the San Joaquin River. Units 6&7 are each serviced by two variable frequency circulating water pumps (CWP) that each have a maximum design flow of 152,800 gpm, or 220 MGD (675 AF/day) (Table 2-1). The total design flow for both Unit 6 and Unit 7 is approximately 305,600 gpm, or 440 MGD (1,350 AF/day). The approach water velocity in front of the bar racks can range from 0.6 to around 0.2 feet per second depending on much electric generation is needed and the number of the variable frequency pumps in operation.

In addition to the Unit 6 and Unit 7 cooling water intake requirements, the CCPP utilizes water for station water supplies, for intermittent intake screen washing, and for fire suppression purposes. At maximum operation, these additional uses account for approximately 22 MGD (67.5 AF/day). The total current design flow for all CCPP operations is approximately 462 MGD (1,418 AF/day) (Table X-2).

Table X-2. Total CCPP design maximum flows by subsystem

	Flow (GPM)	**Flow (MGD)**	**Flow (AF/Day)**
Circulating Water Pumps			
Unit 6	152,800	220	675
Unit 7	152,800	220	675
Subtotal	**305,600**	**440**	**1,350**
Continuous Pumps			
Station Service Pumps	12,000	17.3	53
Jockey Pump (Fire Suppression)	20	0.03	0.1
Subtotal	**12,020**	**17.309**	**53.1**
Intermittent Pumps			
Units 6&7 Screenwash Pumps (1)	5,400	3.9	11.9
Fire Suppression (Main Pump) (2)	2,000	0.7	2.1
Subtotal	**7,400**	**4.6**	**14.1**
TOTAL	**325,020 GPM**	**462 MGD**	**1,418 AF/Day**

(1) Assumes that all three screenwash pumps operate for two hours every four hours per day.

(2) The fire suppression pumps are always available for emergency situations. The normal operating flows are based on testing each pump up to one hour per week to assure pump reliability and to occasionally flush the header system. Flows are calculated assuming the main pump is used for 25% of the year.

- *Variable Frequency Drive (VFD) Circulating Water Pump Operations*

The circulating water pumps at CCPP Units 6&7 and PPP Units 5-6 are mixed flow vertical centrifugal pumps equipped with A-C induction motor drives. The drives have been modified to utilize VFD controls, as well as to operate at full rated speed. The VFD controls provide a means to vary drive speed by varying frequency. For a centrifugal pump, flow is proportional to pump speed. Therefore as frequency and drive/pump speed are reduced, pump flow is also reduced proportionally (i.e., 50% pump speed => 50% pump flow).

When operating in VFD mode, the circulating water pump speed/flow is typically at its minimum level when the unit is at minimum load. The minimum circulating water pump speed/flow is limited by both the pump and motor design and the system head requirements. For PPP Units 5&6 and CCPP Units 6&7 minimum flow is 50% of design and minimum load is ~25–45 MW. As unit load increases, pump speed and flow are increased in accordance with unit conditions. Maximum circulating water speed/flow, 95–100% of design, is typically reached at ~90–145 MW for PPP Units 5&6 and CCPP Units 6&7. River water temperature, tide, condenser vacuum, steam flow, etc., all have an effect on circulating water flow requirements.

- *Current Actual Operational Cooling Water Flows*

Actual flow rates at the Delta Plant have steadily decreased in recent years to be consistently substantially below all maximum permitted flow limits. Capacity utilization rates (the ratio between the annual net generation of power and the total net capability of the facility to generate power) at the Plants have steadily declined over the last five years, and intake flows have correspondingly decreased. For example, the combined 2006 total flow for CCPP Units 6 & 7 and PPP Units 5 & 6 of 40,753 MG (0.13 million AF) was 83% lower than the comparable figure in 2002. See Table X-3. While the California Independent System Operator (CAISO) requires that the Delta Plants be available at any time during the year, the Delta Plants are primarily used during California's peak energy demand periods, particularly in the crucial summer months. The Plants' water intake spiked in 2001 when California's unprecedented energy crisis required almost continual operation to meet electrical demand. Despite this unique circumstance, the overall use of cooling water during the last 20 years shows that water intake has been steadily decreasing, but has been sharply reduced in the last few years. See Figure X-3.

Table X-3. Electrical capacity utilization and cooling water flows for CCPP and PPP from 2002 to 2006.

Plant/Year	**Capacity Utilization (MWh/(MW Capacity * hours of generation)**			**Combined Annual Cooling Water Flows (MG/yr)**	**Combined Annual Cooling Water Flows (million AF/yr)**
CCPP	**Unit 6**	**Unit 7**		**Units 6&7**	**Units 6&7**
2002	28.7	37.4		117,099	0.36
2003	1.9	16.4		46,740	0.14
2004	4.1	21.7		60,926	0.19
2005	1.2	10.1		29,875	0.09
2006	0.8	3.9		15,641	0.05
PPP	**Unit 5**	**Unit 6**	**Unit 7**	**Units 5&6**	**Units 5&6**
2002	19.9	24.5	43.2	120,340	0.37
2003	27.1	7.1	17.2	80,876	0.25
2004	24.0	20.8	9.5	74,991	0.23
2005	12.5	7.3	1.8	34,710	0.10
2006	7.7	5.3	1.4	25,112	0.08

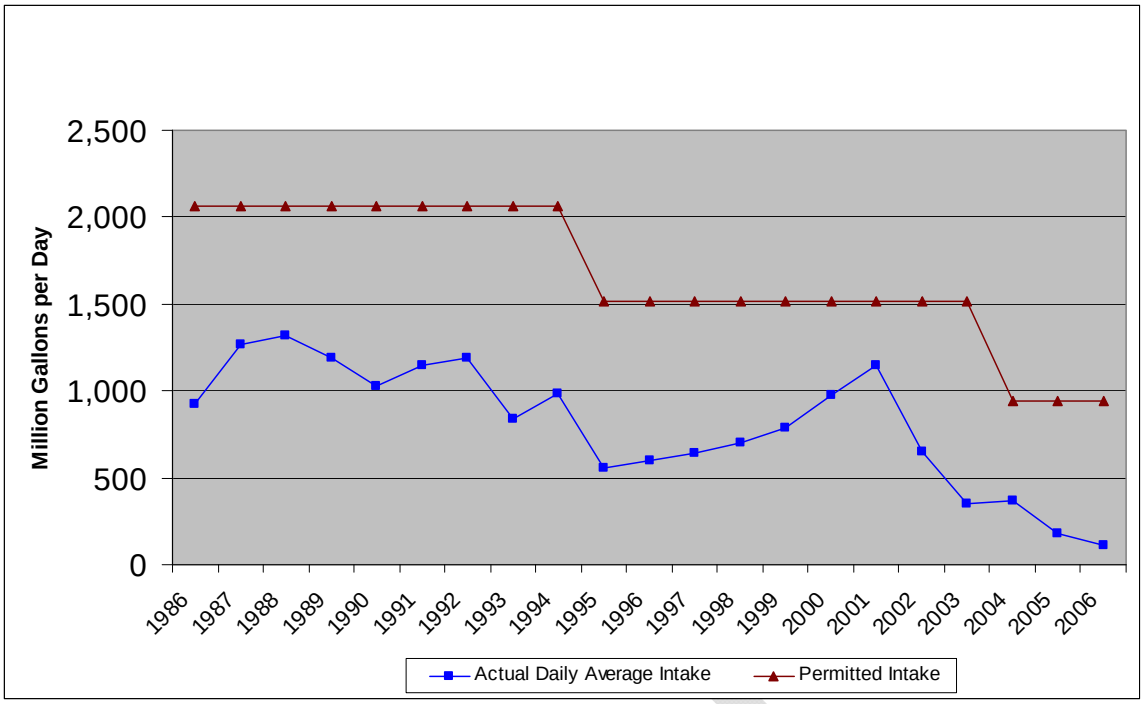

Figure X-3. Average daily flows (MGD) of the CCPP and PPP from 1986 through 2006.

- *Discharge Flows (including Stormwater)*

In addition to once-through cooling flows, Mirant discharges process wastewater and stormwater (quantity and quality of discharges are subject to permits issued by the State Water Resources Control Board and San Francisco and Central Valley Regional Water Quality Control Boards).

- **Recurrent Plant Maintenance and Modification Activities and Monitoring Activities**

  - *Maintenance Dredging, Equipment Maintenance and Modifications, and Levee and Flood Control Maintenance*

Maintenance and modification activities includes those routine activities that maintain the capacity and operational features of the existing power generation facilities at the Delta Plants described above. These activities include periodic maintenance dredging in front of and in the plant cooling water intake structures to remove naturally occurring accumulated sediments to ensure that the approach velocity of cooling water entering the intake structure remains relatively uniform across the intake screen and as close to design levels as possible and to prevent undue damage to the facility from sediment in the cooling water and the related abrasion and wear of power plant equipment, such as condenser tubes and circulating water pumps. Dredging is also sometimes required around the docks and in the discharge outfalls to remove the sediment build so that these structures can function and operate as designed. These activities also include

recurrent equipment maintenance and modifications (such as shoreline and pier maintenance, maintenance and repair of all improvements, infrastructure, roads, electrical facilities, underground linear facilities, vegetation management, etc.), as well as modifications to existing facilities and infrastructure as needed to ensure continued power generation; levee maintenance (such as placement of riprap for shoreline protection and erosion control) as needed to protect the power generation facilities; and flood control maintenance (such as maintenance of Willow Creek at the PPP) as needed.

- *Aquatic Studies & Covered Species Monitoring*

Mirant is conducting, and will recurrently conduct, aquatic and covered species studies and monitoring, specifically involving data collection in the vicinity of the plants, in front of the intake and outfall structures, and within the cooling water system.

- **Planned & Prospective Unit Replacement Projects**

Future power generation projects at the Delta Plants would involve the construction of new units and associated infrastructure. New units would likely require some use of river water (e.g. for station water supplies or cooling tower make-up water), but Mirant anticipates that any new units would not utilize once-through cooling technology and would therefore require only a small fraction of the water required by existing PPP Units 5-6 and CCPP Units 6-7.